

Next Generation Manufacturing: Getting Where We Need To Be!

A White Paper

Submitted by



Manufacturing Matters!

In Missouri, nearly 300,000 people are employed at the more than 8,000 manufacturing companies located throughout the state. Manufacturing accounts for more than 12% of the Gross State Product and for nearly 93% of the state's exports. In Missouri, the average annual manufacturing wage is \$45,953 as compared to the average annual state wage in general of \$37,125.

According to the American Small Manufacturers Coalition, manufacturers account for more than 70% of the U.S. research and development expenditures and employ more engineers and scientists than any other private sector industry.

Introduction to the Next Generation Manufacturing Study

The groundbreaking Next Generation Manufacturing (NGM) Study was developed to better define the strategies and business activities necessary for world-class performance and success into the next generation. More than 2,500 manufacturers across the United States responded to the Next Generation Manufacturing Study — 211 from Missouri. This study presents results from Missouri manufacturers next to responses from all participating manufacturers nationwide; this paper presents Missouri results.

The NGM Study was coordinated by the American Small Manufacturers Coalition (an association of Manufacturing Extension Partnership centers and partners); conducted by the Manufacturing Performance Institute (MPI); and supported by Manufacturing Extension Partnership centers (in Missouri – Missouri Enterprise) and partnering organizations in the following states and regions:

- North & South Dakota
- Florida
- Illinois
- Kentucky
- Missouri
- New England (ME, MA, NH, RI and VT)
- New Jersey
- Ohio
- Oklahoma
- Pennsylvania
- South Carolina
- Texas
- Wisconsin

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The NGM Study consisted of a questionnaire to assess manufacturers' awareness of NGM strategies, progress in implementing best practices that support NGM strategies and success in achieving NGM operational and financial performances. Why? Because these forward-looking NGM strategies are likely to drive manufacturing growth and profitability into the 21st century:

- *Customer-focused innovation:* Develops, makes and markets new products and services that meet customers' needs at a pace faster than the competition.
- *Engaged people/human capital acquisition, development and retention:* Secures a competitive performance advantage by having superior systems in place to recruit, hire, develop and retain talent.
- *Superior processes/improvement focus:* Records annual productivity and quality gains that exceed the competition through a companywide commitment to continuous improvement.
- *Supply-chain management and collaboration:* Develops and manages supply chains and partnerships that provide flexibility, response time and delivery performance that exceeds the competition.
- *Green/sustainability:* Designs and implements waste and energy-use reductions at a level that provides superior cost performance and recognizable customer value.

- *Global engagement*: Secures business advantages by having people, partnerships and systems in place capable of engaging global markets and talents better than the competition.

The NGM Study results establish a “scorecard” for U.S. manufacturers to measure progress in defining strategies within their organizations, implementing best practices to support those strategies and then reaping the performance improvements that can move them into the next generation. A key first step in any manufacturing improvement initiative is to benchmark and compare performances; the NGM Study provides these benchmarks.

The good news in the NGM Study is that many manufacturers in Missouri and across the U.S. are already being guided by NGM philosophies. However, many manufacturers face a sizeable gap between awareness of the importance of NGM strategies and their ability to *implement* these strategies through best practices. Additionally, many manufacturers are not looking to the future (i.e., don’t recognize the importance of these strategies) and, consequently, they don’t recognize the growing gap between their current performances and what will be required of them in the years ahead.

Manufacturers need be proactive in implementing NGM strategies. But national, state and local policy-makers must also look for ways to bring awareness of NGM strategies to their manufacturing constituencies — and to help these firms implement NGM strategies more quickly and broadly than their competitors around the globe.

NGM Study Highlights

The Next Generation Manufacturing (NGM) Study points to a clear path for Missouri manufacturers to succeed in the next generation, offering strategies to improve execution that will result in achieving aggressive new performance goals. Following this path — or ignoring it — will likely mean the difference between success and failure for Missouri manufacturers and U.S. manufacturing in general. Study highlights include:

Becoming a Next Generation Manufacturer – Improvements required to compete in the next generation move through two distinct phases: Recognizing the need to improve (i.e., identifying that a given NGM strategy is important), and then executing the NGM strategy by applying best practices and investing in people, equipment, and product and process technologies to bring about positive changes.

Fortunately, most manufacturers have entered the first phase, recognizing the importance of NGM strategies to their business success. Missouri manufacturers identify superior process improvement (61% of manufacturers rated it “highly important”) and customer-focused innovation (54%) as the most important NGM strategies to their firms’ success over the next five years. Receiving less attention among Missouri manufacturers were human-capital acquisition, development and retention (42%); supply-chain management (37%); global engagement (22%); and green/sustainability (16%).

Unfortunately, recognition that an NGM activity is important doesn’t necessarily lead to superior performance or *world-class* status for the strategy. In fact, there’s a gap between firms’ *recognition* of the importance of NGM strategies and these firms’ *ability* to achieve superior performances (i.e., the percentage that report “highly important” is well below that reporting themselves as world-class¹). Some have adopted the best practices necessary to achieve high performance in an NGM activity, but others are either unaware of best practices, unable to execute them, or unwilling to try. This is illustrated by stark contrasts in performance.

The NGM Study establishes aggressive thresholds for assessing superior performance levels within each of the six categories. The good news is that many Missouri manufacturers are hitting these marks. For example, 7% of firms report value-added per employee of greater than \$175,000. Yet 43% of firms report value-added per employee of less than \$75,000. Awakening *all* Missouri manufacturers to the importance of NGM strategies and helping them develop the practices, acquire the tools, and grow NGM-enabled workforces must be a priority for

¹ Each NGM strategy section includes the definition for what is considered world-class for that strategy. This summary uses the phrase “at or near world-class status” to refer to those firms that answered “4” or “5” on a scale of 1-5 when asked “Rate your organization’s progress toward world-class” in each of the six NGM strategies (where 1= no progress and 5= fully achieved). Analysis of national data for this “at or near world-class” group vs. “furthest from world-class” (those that answered “1,” “2,” or “3”) shows that the world-class group outperforms across the board — in awareness of NGM strategies, in adoption and implementation of best practices, and in achieving pace-setting financial and operational metrics. The group of national manufacturers “at or near world-class status” for each specific NGM strategy is cited throughout this summary to provide a benchmark performance against which to compare manufacturers in the state.

government and manufacturing associations. Without a nudge and assistance, many firms won't be around in the next generation.

Next Generation Competitiveness – Missouri manufacturers must do more to remain globally competitive. The NGM Study finds that manufacturers at or near world-class status for NGM strategies do three things differently than manufacturers furthest from world-class:

- They invest more time and effort into that particular NGM strategy.
- They manage differently, implementing best practices at far higher rates.
- They outperform manufacturers furthest from world-class on a wide array of operational and financial metrics.

Currently, only a small percentage of Missouri manufacturers are at or near world-class in at least one of the six NGM strategies. On the positive side, this means that benchmark firms exist for others to emulate. On the negative side, however, many firms report “no progress” toward world-class status for the strategies and are struggling.

There was a day when “good enough” might have been good enough for Missouri manufacturers and their markets. Those days are gone. Missouri manufacturers need to make progress toward world-class status or they won't be competing against the world in the next generation.

Size Matters in the Next Generation – Significantly less than half of small U.S. manufacturers (those with less than \$10 million in revenue) rate themselves as at or near to world-class status in each of the NGM strategies, with the highest percentage occurring for superior process improvement (38%). This data indicates that a substantial swath of the U.S. manufacturing base has significant opportunities for improvement in order *to compete* in this economy.

Many smaller manufacturers face challenges in improving as much or as quickly as larger firms — smaller staffs and scarce resources often limit their capacity for change. Smaller firms rated lower overall in recognizing the importance of the six strategies and in making progress toward world-class status.

Differences for small manufacturers nationwide are particularly noticeable regarding the existence of measurement systems and review processes for the six NGM strategies. Smaller firms are more likely to indicate “no measurement system per se or reviews” than larger firms. For example, 38% of manufacturers with revenues of \$10 million or less have no measurement system or reviews in place to assess customer-focused innovation vs. 19% of larger manufacturers.²

What Gets Measured in the Next Generation Gets Better – What gets measured, gets done. But manufacturers across the country and Missouri rated themselves relatively low in measurement systems. Utilization of advanced measurement systems and review processes is a reliable indicator of an organization's willingness and ability to continuously improve. The NGM Study reveals a significant opportunity for improvement in Missouri manufacturers' measurement systems. For example, 31% have no measurements systems or reviews in place to track supply-chain management.

Similarly, very few manufacturers have the most advanced systems in place (“Regular monitoring and review of company-specific metrics by CEO and senior staff” or “Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization.”)

Going Green in the Next Generation – While the public at large is rapidly embracing Green, a relatively small percentage of Missouri manufacturers rated themselves as making a substantial effort to adopt Greener practices and produce Greener products. For example, only 9% of manufacturers have been able to annually reduce their energy usage per unit of product by more than 10%, and only 16% have reduced their use of non-recycled material per unit of product by more than 10%. There's also a concerning lack of awareness among many in sustainable strategies (12% believe it is “not important”).

² Data for individual states was not cross tabulated by size of manufacturers (i.e., revenues) because sample sizes varied dramatically by state. Aggregated national data offers greater statistical relevance.

Manufacturers in Missouri and across the country need to further recognize the importance of implementing green/sustainable strategies in their firms and increased education, awareness of market changes will be necessary to increase the importance of green to the nation's manufacturers.

Changing Leadership in the Next Generation – Approximately 24% of Missouri manufacturers have a leadership succession planned in the next five years; another 29% may have a transition in leadership. “May have” meaning that more than half of all manufacturers are already considering their own next-generation leaders. This represents a significant challenge *and* opportunity for manufacturers over the next five years.

Transforming into a Next Generation Manufacturer requires leadership, consistency in direction, energy, passion and skill. With so many manufacturing leaders expected to exit executive ranks, it will be critical for these firms facing succession — and critical for policymakers who believe in manufacturing — to address this leadership transition while today's leaders are currently in place.

Next Generation Manufacturers Require Support Services – The vast majority of Missouri manufacturers reports that assistance in their geographic regions, that is, support services, peer groups, training opportunities and resources to help them follow through on NGM strategies, exists to some degree.

But, a significant percentage believes that “no support” exists. In some regions this may be the case, but it's important to note that other factors may be at play.

Manufacturers nationwide that are at or near world-class status for an NGM strategy are more likely to indicate a stronger level of regional support than their non-world-class peers. This could mean that world-class manufacturers have greater access to support services or it could mean that world-class manufacturers are more likely to seek out and engage regional support services.

Innovation is Key Strategy for the Next Generation Manufacturer – Every manufacturer — regardless of industry or location — must either transform itself into a Next Generation organization or accept permanent second- or third-tier profitability. Innovation in the six key NGM strategies is a primary element for that transformation to take place.

- Innovations in new products and services that are meaningfully unique will allow manufacturers to charge more rather than having to compete on the downward spiral of lower pricing.
- Innovations in process improvements will increase profitability.
- Innovations in human capital acquisition, development, and retention will provide a skilled workforce that is engaged in continuous improvement.
- Innovations in supply chain management enable partnerships that deliver performance expected by customers and better than the competition.
- Innovations in green sustainability allow manufacturers to capitalize on the growing “green” movement rather than being left behind by those who see its market opportunities.
- Innovations in global engagement will enable Missouri manufacturers to capture markets that were previously unavailable to them.

Therefore, a key economic development strategy is for Missouri to establish the infrastructure that will enable and promote innovation within small and medium sized manufacturers. The NGM study revealed there was a fairly wide disparity between awareness of the six key next generation strategies and implementation. The same holds true for innovation. Many small and medium sized manufacturers simply do not know how to innovate and are not aware of resources that can help them innovate. Missouri's successful manufacturing strategy should include both innovation training and resources.

For more information and additional results of the Next Generation Manufacturing Study, please contact

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